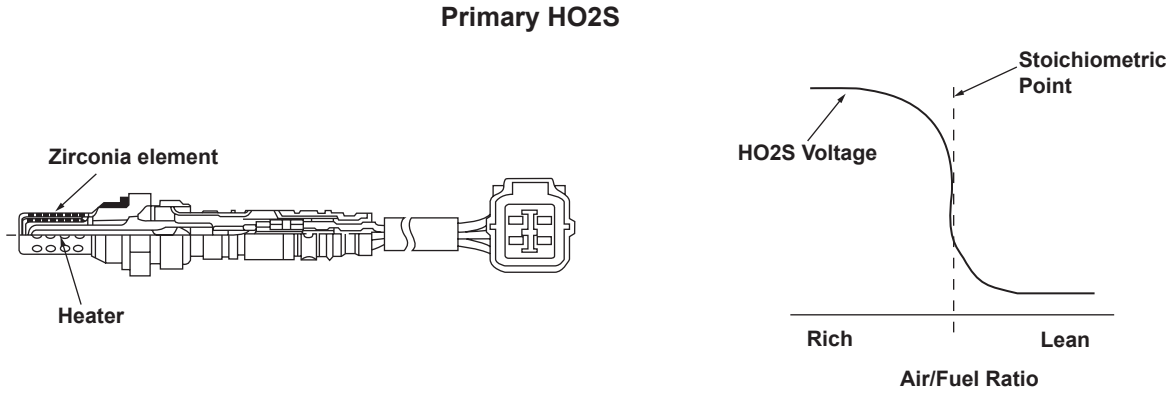
DTC P0133: Primary Heated Oxygen Sensor (Primary HO2S) (Sensor 1) Slow Response



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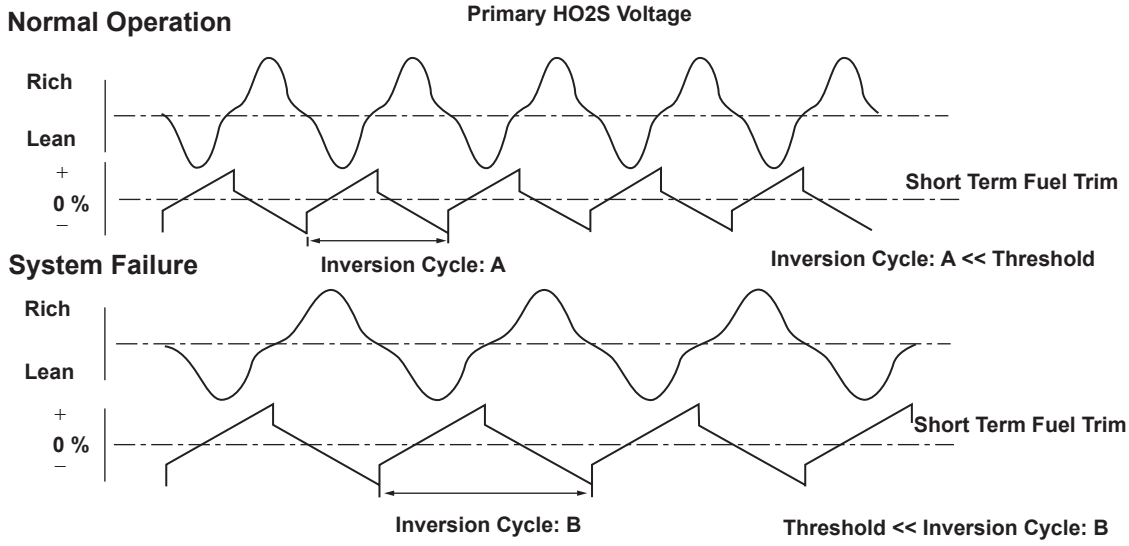

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General Description

The primary heated oxygen sensor (HO2S) (Sensor 1) is installed in the exhaust system. It detects the oxygen content in exhaust gas and transmits voltage to the engine control module (ECM)/powertrain control module (PCM). The ECM/PCM monitors the primary HO2S voltage value and controls the amount of injected fuel (air/fuel ratio feedback control) so that the air/fuel ratio is close to the stoichiometric air/fuel ratio. The air/fuel ratio correction coefficient for correcting the amount of injected fuel is the short term fuel trim. If the primary HO2S voltage is low, the air/fuel ratio is lean, so the ECM/PCM uses A/F feedback control to issue a Rich command. If the primary HO2S voltage is high, the air/fuel ratio is rich, so the ECM/PCM uses A/F feedback control to issue a Lean command. The ECM/PCM also monitors the inversion cycle (average) of the primary HO2S (Sensor 1) signal during air/fuel ratio feedback control. If the actual inversion cycle measured for a specified period of time is longer than a predetermined cycle, the ECM/PCM detects a malfunction and a DTC is stored.

Monitor Execution, Sequence, Duration, DTC Type

Execution	Once per driving cycle
Sequence	None
Duration	15 seconds or more
DTC Type	Two drive cycles, MIL ON

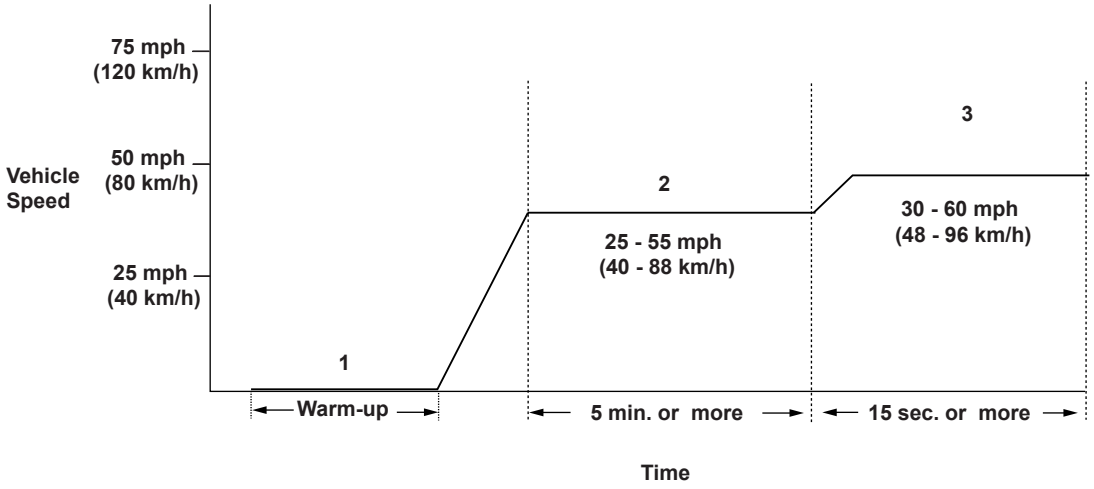
Enable Conditions

Condition		Minimum	Maximum
Engine coolant temperature		140ºF (60ºC)	212ºF (100ºC)
Intake air temperature		32ºF (0ºC)	—
Engine speed		1,300 rpm	2,500 rpm
MAP value	1,500 rpm	48 kPa (360 mmHg, 14.2 in.Hg)	80 kPa (602 mmHg, 23.7 in.Hg)
	2,500 rpm	23 kPa (172 mmHg, 6.8 in.Hg)	
Vehicle speed		30 mph (48 km/h)	62 mph (100 km/h)
Fuel trim		0.73	1.47
Fuel feedback		Closed loop	
Monitoring priority		EVAP, Catalyst System	
No active DTCs		ECM/PCM, Primary HO2S, Primary HO2S Heater, Secondary HO2S, Secondary HO2S Heater, MAP, CKP, ECT, TP, CYP, IAT, EGR, BARO, VSS, VTEC System, Fuel System, Misfire	
Other		Other than when there is excessive vapor generation (fuel level is 40 - 80%)	

Malfunction Threshold

An inversion cycle of the primary HO2S is at least 2.0 seconds*1, 1.8 seconds*2, 2.5 seconds*3.
*1: F23A1 engine
*2: F23A4 engine
*3: F23A5 engine

Driving Pattern



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1. Start the engine. Hold the engine at 3,000 rpm with no load (in park or neutral) until the radiator fan comes on.
2. Drive the vehicle at a speed between 25 - 55 mph (40 - 88 km/h) for at least 5 minutes.
3. Then, drive immediately at a steady speed between 30 - 60 mph (48 - 96 km/h) for at least 15 seconds.

- If the EVAP monitor runs instead of the HO2S monitor, turn the engine off, then restart it, and the HO2S monitor will restart.
- If you have difficulty duplicating the DTC, retest after turning off electrical components such as the audio system and A/C, and try a different gear position.
- Drive the vehicle in this manner only if the traffic regulations and ambient conditions allow.

Diagnosis Details

Conditions for illuminating the MIL

When a malfunction is detected during the first drive cycle, a Temporary DTC is stored in the ECM/PCM memory. If the malfunction recurs during the next (second) drive cycle, the MIL comes on and the DTC and the freeze frame data are stored.

Conditions for clearing the MIL

The MIL will be cleared if the malfunction does not recur during three consecutive trips in which the diagnostic runs.
The MIL, the DTC, the Temporary DTC, and the freeze frame data can be cleared by using the scan tool Clear command or by disconnecting the battery.